

REVIEW of
**“Status Review of Smalltooth Sawfish (*Pristis pectinata*).
December 2000”**

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1 Executive Summary

A review was conducted on the smalltooth sawfish (*Pristis pectinata*) for the purpose of assessing whether the population within federal waters should be listed under the Endangered Species Act (ESA). The review gathered together, summarises and interprets all scientific and other pertinent information on this species appropriate for making a decision on whether the smalltooth sawfish is in danger of extinction through all or a significant proportion of its range from factors listed in the ESA. Based on the available information, the report concluded that the smalltooth sawfish population is in danger of extinction and therefore supports its listing as an endangered species under the ESA.

The report, “Status Review of Smalltooth Sawfish (*Pristis pectinata*). December 2000”, covers all available information on this species to my knowledge. I found the smalltooth sawfish status review document and the proposed rule to list smalltooth sawfish properly use the best available scientific and commercial data. The information is adequate to support the final conclusion of the document, that this species warrants endangered status. I found the Federal Register Proposed Rule summarises information from the status review accurately and I agree with designation of the U.S. DPS of smalltooth sawfish as endangered as defined in the ESA. Otherwise I make some minor comments with respect to the status review.

2 Introduction

The Endangered Species Act (1973) defines an “endangered species” as “any species which is in danger of extinction throughout all or a significant portion of its range”, and a “threatened species” as “any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Section 4(b)(1)(A) of the ESA requires that NMFS list species based solely on the best scientific and commercial information available, taking into account any efforts being made by any state or foreign nation to protect such species.

Currently smalltooth sawfish are listed as candidate species (64 FR 33466), which notifies the public that National Marine Fisheries Service (NMFS) is concerned that this species may warrant listing as endangered or threatened in the future. The candidate species list is intended to encourage voluntary conservation efforts to avoid an ESA listing as well as give due warning if a species may be approaching endangered status.

On November 30, 1999, NMFS received a petition from the Center for Marine Conservation with a request that NMFS list North American populations of smalltooth sawfish and largetooth sawfish as endangered under the ESA. This petition was based on criteria specified in the ESA, namely: (1) the present or threatened destruction, modification, or curtailment of its habitat or range; (2) over-utilisation for commercial, recreational, scientific, or educational purposes; (3) the inadequacy of existing regulatory mechanisms; and (4) other natural or manmade factors affecting its continued existence. A fifth criterion, related to predation and disease, was not felt relevant in this case. As the smalltooth sawfish petition contained sufficient information to support its listing, NMFS published its determination on 10th March 2000 that a smalltooth sawfish status review should be undertaken (65 FR 12959) as required by ESA section 4(b)(1)(A). The status

review, completed in December 2000, addressed the status of the species, the five listing determination criteria, and the effect of efforts underway to protect the species.

This review assesses whether the status of the smalltooth sawfish was adequately determined to support the conclusions of the report. It was conducted between 5th and 9th August 2001 in the United Kingdom.

3 Review of Information Used in the Assessment

Data and information on the species is clearly very limited. The species is physically hard to handle, now rarely encountered, and it has never been targeted in a fishery. This lack of knowledge makes any assessment very uncertain. However, it is not unusual to rely on limited data for identifying endangered species, as they are by their very nature rarely observed. The following types of data were the main sources used.

3.1 Life History Information

Basic information on the biology and life history is available, albeit sparse. The main point (also main in the “Other Natural or Manmade Factors Affecting Its Continued Existence” section) is that the species is long-lived, has low fecundity and high age at first maturity. This means even a low fishing mortality applied to smaller fish may result in an unsustainable take. The further implication is that recovery times to unexploited state may be very long. This vulnerability is evidence that fishing activities could lead to local extinction of populations that coincide with fishing grounds.

3.2 Observations / records from compiled literature accounts, museum collection specimens and other records of the species.

The report describes these records in detail state by state. The main problem with this type of data is the consistency with which data are collected making statistical interpretation difficult. As well as using the document, I also reviewed the data provided.

The status review did not contain any quantitative analysis of the number of reports of smalltooth sawfish. The problem with analyses of this sort of time series, particularly where the number of reports are small, is spurious trends can be introduced very easily. However, there would appear to have been fewer reports nationally (excluding Florida) over the last 15 years compared to 1912-1960 (Figure 1). Also, assuming a common trend in levels of reporting as opposed to abundance, there has been a decline in the proportion of reports from states other than Florida (Figure 2). This suggests a decline in range if not the population size in Florida, and supports the general conclusions of the status review.

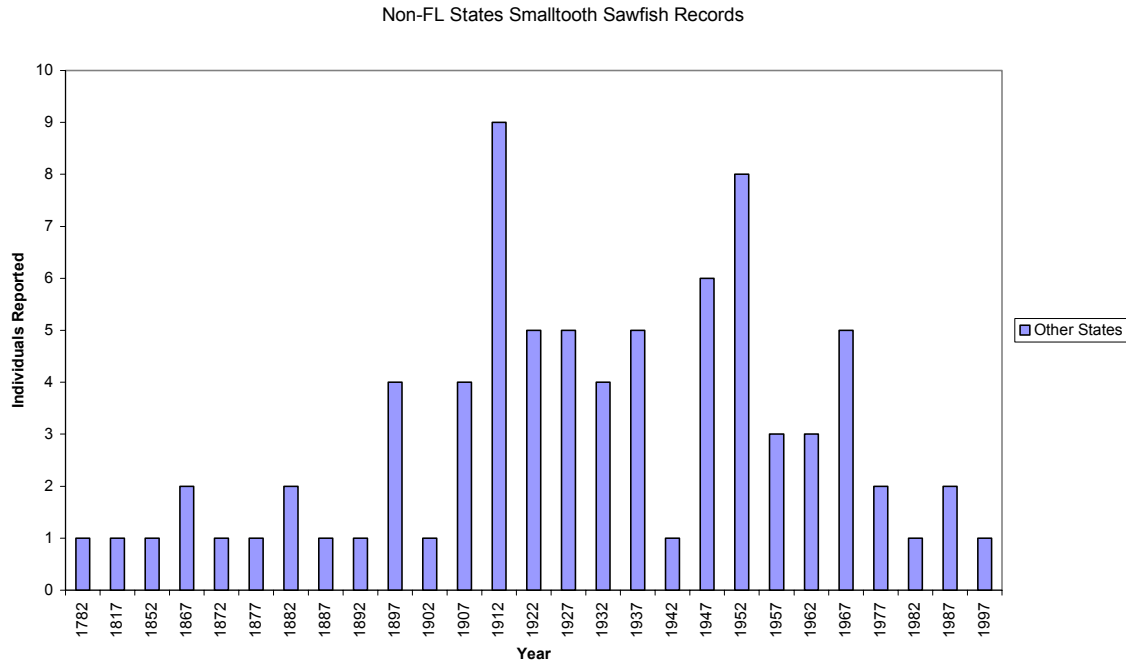


Figure 1 Numbers of individuals reported in smalltooth sawfish records by 5-year periods, excluding Florida. Prior to 1907, very few reports were made. Between 1907-1967 reports have been relatively consistent, although the number of fish in the records is small. Since 1982, reports have become rarer.

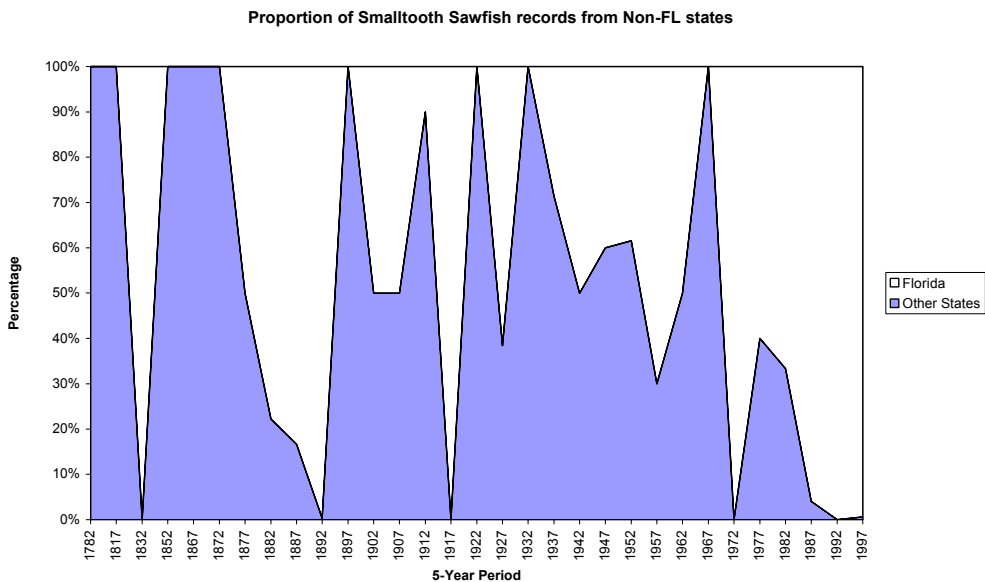


Figure 2 Number of individuals reported as a proportion between Florida and all other states combined. In the last 15 years in particular, Florida has shown increasing reports of this species, presumably because of improvements in data collection and reporting. Assuming similar improvements have occurred in other states, populations outside Florida have shown a decline, perhaps going back to 1950 (with the exception of 1962-1966 when there were no Florida records).

3.3 Louisiana Catch and CPUE data

The only reported catches are Louisiana landings, mostly as by-catch in the shrimp trawls and reports from the Florida recreational fishery. The absence of data from elsewhere suggests catches are too low for fishermen or authorities to record and/or there is no market for this species.

Appendix C indicates a clear decline in reported smalltooth sawfish landings in Louisiana 1950-1978. It is possible, however, that landings have declined due to increased discarding, but catches remained stable. The price has declined over the period of the fishery (Figure 3), which may indicate a decline in market demand making landing sawfish unattractive. However, I found no correlation between landings and price (Figure 4), suggesting price has not been a significant factor in declining landings. Increased discarding is not supported by anecdotal evidence. Therefore, the decline in landings per unit effort is most likely indicative of a depletion of the sawfish population in the shrimp fishery area.

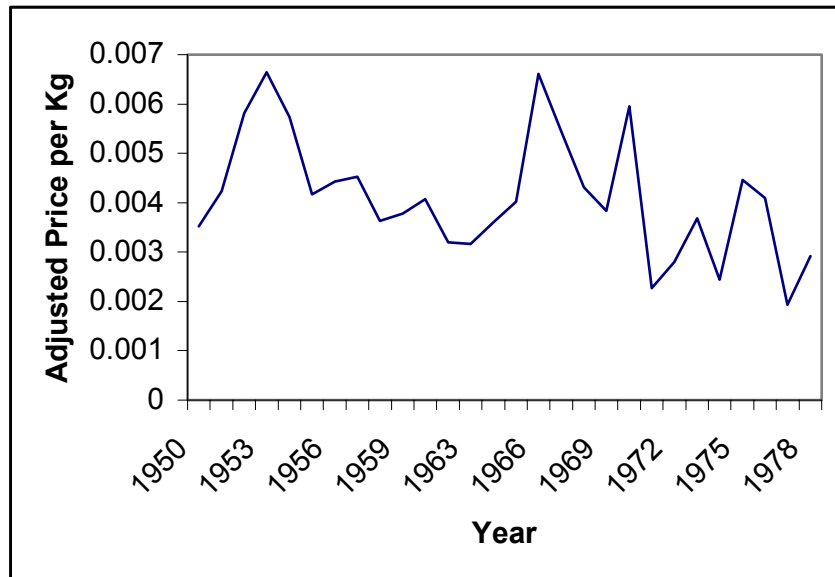


Figure 3 Price per kilogram adjusted by the all-city annual average consumer price index (1982-84=100) for smalltooth sawfish landings. Note that the price is very low, but also shows an overall decline over the period.

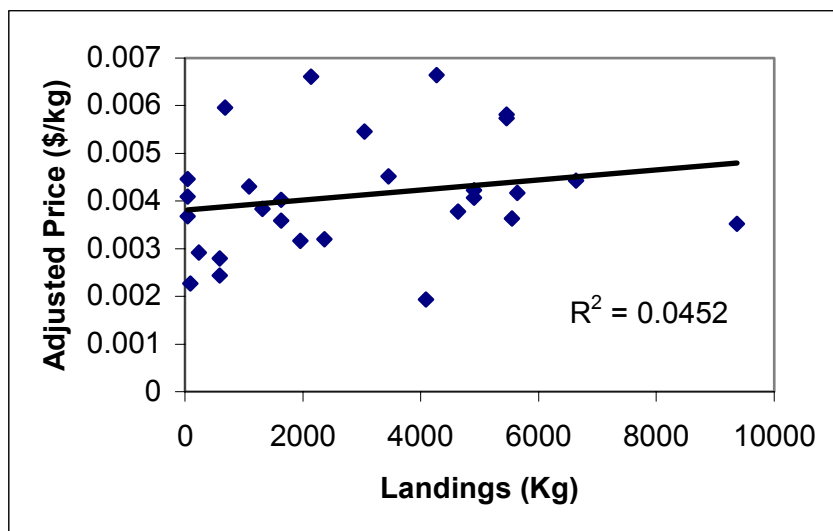


Figure 4 Adjusted price per kilo plotted against landings. There is no evidence of relationship between price and landings, suggesting price is not a significant factor in landings quantity.

The Florida recreational catch data shows no decline in the Florida Everglades National Park. Catches are rare, but show no evidence of decline since 1989. Unfortunately this time series does not extend over the critical period 1950-1990, so it is not possible to use this information to assess the status of the Florida population. However, the lack of evidence of a decline during this period suggests the Everglades National Park is providing adequate protection, and could be used as a blue print for recovery of populations elsewhere.

4 Review of the Assessment Results

4.1 DPS designation

The status review argues for a DPS designation based on the NMFS definitions. The Florida population appears to be consistent with this definition.

I know of no other populations in the region (West Atlantic / Caribbean). Suitable habitat might occur in Central and South America, but I would judge that there would be no unthreatened populations elsewhere. The lack of reports is also symptomatic of a lack of control in the region's fisheries, so that even if a population was identified, protection would be poor.

Most of the habitat used by smalltooth sawfish will coincide with productive fishing grounds. These grounds are likely to attract not only shrimp trawlers, but a wide range of set-net gears used by artisanal fisheries. Given the vulnerability of this species to this gear, The US population may be the best protected in the Atlantic. This, arguments in the review and the absence of broadcast spawning, makes the US populations both discrete and significant in my opinion.

4.2 Decrease in Range and Abundance

A review of records compiled by the authors suggests that the smalltooth sawfish range has been considerably reduced. This interpretation depends upon the lack of reports of this species from many states where recording had been made previously. As it would be expected that effective sampling for this has increased, I would accept this as evidence for a reduced range, but monitoring and assessment should form a significant component of future research.

4.3 Analysis of Listing Factors

The listing factors are prescribed in the ESA. The discussion appears to cover all potential factors that may affect this species. The review indicates that overexploitation is the most likely primary reason for reduced abundance and range, with habitat degradation a contributing factor. This is consistent with the information provided and what is known about the species. While regulatory authorities, laws and policies provide some protection for habitat, giving perhaps the opportunity for recovery, only the Everglades National Park is likely to provide adequate protection to maintain a stable population. Prohibition of set and drift nets would seem to be a minimum requirement for this species.

The section “Other Natural or Manmade Factors Affecting Its Continued Existence” deals with life history attributes of the species. Smalltooth sawfish is undoubtedly vulnerable to exploitation. It exhibits characteristics common with many species which are unable to sustain high fishing mortality. These factors do not however, in the normal run of things, endanger the species, so it seems odd to present them here. Unlike the other factors listed, they are not an active cause of declines or increases in abundance, although they may determine the rate of change. The population characteristics are reasons for this species vulnerability, like its high catchability in net gears, and would in my opinion be better presented as part of the “Overutilization for Commercial, Recreational, Scientific or Education Purposes” section. However, I can see this section may be used as a catch-all, allowing the assessors to raise or emphasise any issues they feel important, and this section does that.

The section “Current Conservation Efforts”, under “Awareness Initiatives” includes the World Conservation Monitoring Centre’s listing of this species as endangered. The IUCN Red List 2000 designates the Atlantic/Mediterranean sub-population as “critically endangered” rather than just endangered. This may be an inconsistency in the Red List as the species overall is endangered, but includes the Indian Ocean populations which, as they state, may not belong to this species at all. I would guess that their determination is based on mostly the same information as that used in this status review, but according to their own criteria. Nevertheless, this suggests a wide recognition of the threats to this species.

5 Review of Scientific Advice

I believe the information is adequate to list the species as endangered (Federal Register 66 19418 / Proposed Rule). While there are gaps in the available information, there is a

clear balance of evidence which indicates the abundance of this species has declined over most of its range.

6 Recommendations

I recommend that the status of smalltooth sawfish outlined in the review is accepted. That is, the continued existence of the U.S. DPS smalltooth sawfish is in danger of extinction throughout all or a significant portion of its range.

A research and monitoring programme should be set out covering the recommendations made in the status review. The research would form part of the recovery programme as it should set out to specify both what and how the recovery programme should be implemented, and identify clear targets (reference points) to monitor recovery.

A stock assessment should not be conducted until significant new information has become available. The current data are clearly inadequate to go much beyond the analyses carried out for the status review. More basic biological research and development of statistically sound surveys needs to be undertaken first.

To this end, I would emphasise three of the research areas:

- Development of a population model, which can be used to interpret data from other research, assess the state of the population, identify key uncertainties which can be addressed by research and so on.
- Critical habitat identification appropriate to this species could lead to appropriate protection extending along the coast from the Everglades National Park, allowing a recovery of range and abundance.
- A long-term tag capture-recapture programme, with the co-operation of the recreational fishery, could provide the best information on the state of the population, its dynamics and distribution. It would also raise awareness of the species and co-operation could be a pre-requisite for obtaining a permit for accidental takes.

7 Appendix 1: Summary of Available Information

In order to conduct a comprehensive review, a status review team was created to investigate the status of the species with regard to the listing criteria provided by the ESA. In addition to their own resources and data, the status review team gathered all known records and data of smalltooth sawfish by contacting fishery managers, museums and other research collectors. This status review contains the best scientific and commercial information available on smalltooth sawfish.

Adams, W. F., Bailey, C. M., Branstetter, S., Burgess, G. H., Castro, J. I., Lee, J. L., Musick, J. A. (2000) Status Review of Smalltooth Sawfish (*Pristis pectinata*). December 2000.

In addition to the text of the document, three appendices of data were available:

Appendix A: Smalltooth sawfish records 1872-2000 compiled by the status review team.

Appendix B: National Everglades Park Recreational Fishing Data 1989-1999: Smalltooth sawfish recreational sport (non-guided) fishing CPUE data and number of smalltooth sawfish caught by year and area.

Appendix C: Louisiana State landings records for smalltooth sawfish 1950-1978.

Based on the status review, a summary was published through the Federal Register:

Federal Register 66(73) 19414-19420. 16 April 2001. Proposed Rules. 50 CFR Part 224. Endangered and Threatened Species; Proposed Endangered Status for a Distinct Population Segment of Smalltooth Sawfish (*Pristis pectinata*) in the United States.

The information in this document reproduces information in the main review, so comments on data and the assessment apply to both documents.

8 Appendix 2: STATEMENT OF WORK

Consulting Agreement Between The University of Miami and Dr. Paul Medley August 1, 2001

General

The National Marine Fisheries Service was petitioned to list U.S. populations of smalltooth sawfish as an endangered species under the Endangered Species Act (ESA) on November 30, 1999. In order to conduct a comprehensive review of smalltooth sawfish, a status review team was created to investigate the status of the species with regard to the listing criteria provided by the ESA. In addition to its own resources and data, the status review team gathered all known records and data of smalltooth sawfish by contacting fishery managers, museums and other research collectors. The document addresses the status of the species, the five listing determination criteria, and the effect of efforts underway to protect the species. NMFS has accepted the findings of the status review and, on April 16, 2001, published a proposed rule to list smalltooth sawfish as an endangered species.

NMFS is required to use the best scientific and commercial information available in its ESA listing decisions, and has a policy of seeking peer review of its ESA status review documents. The current review of the smalltooth sawfish status review document will help ensure and confirm that the final listing decision is based on the best available information.

The consultant is expected to evaluate whether the smalltooth sawfish status review document and the proposed rule to list smalltooth sawfish properly use the best available scientific and commercial data. The consultant should identify important additional sources of information of which the consultant may be aware and provide critique and comments on the documents.

Specific

The consultant's duties shall not exceed a maximum total of four days, including reviewing background material and producing a written report of the findings. It is expected that the individual contribution of the consultant shall reflect the consultant's area of expertise; therefore, no consensus opinion (or report) will be accepted. Specific tasks and timings are itemized below:

1. Read and become familiar with the relevant documents provided in advance to the consultant;
2. No later than August 13, 2001, submit a written report of findings, analysis, and conclusions. The report should be addressed to the "UM Independent System for

Peer Reviews, “ and sent to David Die, UM/RSMAS, 4600 Rickenbacker Causeway, Miami, FL 33149 (or via email to ddie@rsmas.miami.edu).

Signed_____

Date_____